

**Claim Rejections - 35 U.S.C. 112**

Reconsideration and withdrawal of the rejection of claims 1-16 under 35 U.S.C. 112, 1st paragraph, for containing new matter is respectfully requested. The term "morphologically" has been deleted.

**Rejection under 35 U.S.C. 103**

Claims 1-16 stand rejected under 35 U.S.C. 103 (a) as being unpatentable over *Heine* (US 5,874,170) and *Krause* (US 5,958,532).

The component according to the present invention comprises at least one support member having a first connecting portion and at least one part having a second connecting portion. The second connecting portion is connected to the first connecting portion. For achieving a permanent adhesive connection between at least the second connecting portion and the first connecting portion, the second connecting portion of the at least one part is comprised of poly fluorocarbon and a surface of at least the second connecting portion is activated by plasma activation to form an activated surface for connecting the at least one support member and the at least one part. The activated surface is plasma-etched by a micro sand-blasting effect caused by the plasma activation in a micro area.

The feature of the plasma-etching/micro-sandblasting effect caused by the plasma activation is disclosed on page 3, lines 9-11, of the specification.

Please note that the term "plasma activation", aside from the frequent use of "plasma-activated", can be found in the specification on page 8, line 9.

The examiner argues that the primary reference *Heine* shows a connecting portion comprising poly fluorocarbon which is activated by plasma treatment for connecting a support member and a part. In particular, the examiner states that a seal for movable structural components comprising a support member made of plastic material and a poly tetrafluoroethylene sealing member bonded directly to the support member is disclosed (for example, in col. 1, lines 39-46; col. 4, lines 9-36; as well as in Figs.1-5 and 7-10). The examiner moreover cites *Krause* as showing a method of directly adhering an integral and chemically bonded layer of a thermoplastic polymer, such as an elastomer, to a fluoropolymer substrate by activating the fluoropolymer substrate layer by plasma treatment providing a fluoropolymer thermoplastic seal with enhanced flexibility and high

chemical and electrostatic discharge resistance. The examiner refers to column 1, line 57, to col. 2, line 30, of this reference. In examiner's opinion, it would have been obvious to combine the teachings of the two references in order to attain an integrally stronger fluoropolymer/thermoplastics seal with improved flexibility, durability and chemical resistance.

In regard to the reference *Heine* applicant would like to point out that no **plasma activation** but plasma polymerization is taught in this reference. A support member 2, 2' of plastic material is to be connected to a sealing element 4, 4' made of PTFE. The surface of the PTFE sealing element 4, 4' is altered by introducing a plastic material which is compatible with the plastic material of the support body 2, 2'. This is described in claims 1 and 2 as well as column 2, lines 48ff. The compatible plastic material, as described in detail in column 3, lines 5-11, is applied by means of plasma polymerization onto the PTFE sealing element 4, 4'. This compatible plastic material acts as a bonding agent in order to fixedly connect the sealing element 4, 4' to the support member 2, 2' by what is called "substance lock" in the reference. The connection is thus made possible by adding a third component in the form of the compatible plastic material which is added to the PTFE material of the sealing member.

Plasma polymerization has nothing in common with plasma activation as claimed in the present invention in claim 1. The plasma activation causes a plasma-etching with a micro-sandblasting effect. The plasma activation or plasma etching makes the employment of a compatible plastic material obsolete for connecting the support member and the part. The compatible plastic material which must be applied according to the prior art is not required according to the present invention because the plasma activation on the surface of the part causes a micro-sandblasting effect (plasma etching) in the micro area. *Merriam-Webster's Collegiate Dictionary* (see enclosed copy of the online version) defines etching as follows:

"to produce (as a pattern or design) on a hard material by eating into the material's surface (as by acid or a laser beam)"

This means a physical change of the surface, i.e., a roughening of the surface. This

is clearly different from plasma polymerization as described by prior art reference *Heine et al.* where a third material is incorporated by plasma polymerization (or vapor deposition) into the material of the surface of the sealing member 4. According to the present invention, there is no additional material required in order to bond the part to the support member: the surface is plasma-etched and in this way properly prepared for bonding.

In regard to the reference *Krause* applicant would like to point out that it is explicitly described in column 2, lines 4-17, that polymer surfaces typically lack the irregular structure that is necessary to achieve an effective mechanical bond. *Krause* furthermore discloses that for this reason typically etching or scuffing is employed in order to roughen the surface physically. It is then stressed that the invention of *Krause* pursues a different path that does not require mechanical alteration of the surface because, instead, a chemical bond is incorporated. Moreover, it is stated that the method according to *Krause* does not result in significant changes occurring with regard to the physical structure of the substrate surface by exposure to the charged gas atmosphere that is employed according to *Krause*, as proven by microscopic techniques.

Accordingly, this reference explicitly states that the disclosed process employing a charged gaseous atmosphere formed by electrically ionizing a gas (plasma treatment) does not cause etching or scuffing or roughening of the surface but provides chemical bonding. This is enabled by exposing the fluoropolymer substrate to the charged gaseous atmosphere and by inserting into the **molecular structure of the substrate surface various functional groups** (see col. 6, lines 48-60).

Accordingly, the primary reference *Heine* describes plasma polymerization on the surface of the sealing member, i.e., a chemical process is induced by the plasma treatment, and the secondary reference to *Krause* explicitly states that a chemical alteration of the surface is achieved by the plasma treatment and specifically disclaims any type of roughening or physical alteration of the substrate surface being caused by the plasma treatment.

Therefore, neither one of the cited references discloses plasma activation causing plasma-etching with a micro sand blasting effect which facilitates bonding between the support member and the part.

Claim 1 as amended and its dependent claims are therefore believed to be allowable over the cited prior art references.


**CONCLUSION**

In view of the foregoing, it is submitted that this application is now in condition for allowance and such allowance is respectfully solicited.

Should the Examiner have any further objections or suggestions, the undersigned would appreciate a phone call from the examiner to discuss appropriate amendments to place the application into condition for allowance.

Authorization is herewith given to charge any fees or any shortages in any fees required during prosecution of this application and not paid by other means to Patent and Trademark Office deposit account 50-1199.

Respectfully submitted on August 19, 2002,

  
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Encl.: - amended claim1 (clean copy and marked-up version);  
- 2 pages Merriam-Webster's Online (entry: "etch")

## MARKED-UP CLAIM VERSION TO SHOW CHANGES MADE

1. (Twice amended) A component comprising at least one support member (1) having a first connecting portion and at least one part (6, 28) having a second connecting portion (7), wherein said second connecting portion (7) is connected to said first connecting portion, wherein for achieving a permanent adhesive connection between at least said second connecting portion (7) and said first connecting portion, said second connecting portion of said at least one part (6, 28) is comprised of poly fluorocarbon, wherein a surface of at least said second connecting portion (7) is activated by plasma activation to form a plasma-activated surface treatment for connecting said at least one support member (1) and said at least one part (6, 28), wherein said ~~plasma-treated-connecting portion (7)~~ plasma-activated surface is plasma-etched by a micro sand-blasting effect caused by the plasma activation chemically and morphologically altered in a micro area, and wherein an adhesion-supporting intermediate component is not necessary for an adhesive connection.

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etch[1,verb]   
etching   
freeze-etching 

Main Entry: <sup>1</sup>etch   
Pronunciation: 'etch  
Function: verb  
Etymology: Dutch *etsen*, from German *ätzen* to etch, corrode, from Old High German *azzen* to feed; akin to Old High German *ezzan* to eat — more at EAT  
Date: 1634  
*transitive senses*

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**Main Entry: <sup>1</sup>etch**  
Pronunciation: 'etch  
Function: *verb*  
Etymology: Dutch *etsen*, from German *ätzen* to etch,  
corrode, from Old High German *azzen* to feed; akin to Old  
High German *ezzan* to eat — more at **EAT**  
Date: 1634  
*transitive senses*  
1 a : to produce (as a pattern or design) on a hard material  
by eating into the material's surface (as by acid or laser  
beam) b : to subject to such etching  
2 : to delineate or impress clearly <scenes *etched* in our  
minds> <pain was *etched* on his features>  
*intransitive senses* : to practice etching  
- *etch·er noun*

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